

- homosexual men with AIDS. *Inquiry*. 1991; 28:249-254.
7. Kass NE, Faden RR, Fox R, Dudley J. Homosexual and bisexual men's perceptions of discrimination in health services. *Am J Public Health*. 1992;82:1277-1279.
  8. Cheng TL, Savageau JA, Sattler AL, DeWitt TG. Confidentiality in health care: a survey of knowledge, perceptions and attitudes among high school students. *JAMA*. 1993;269:1404-1407.
  9. Fehrs LJ, Fleming D, Foster LR, et al. Trial of anonymous versus confidential human immunodeficiency virus testing. *Lancet*. 1988;ii:379-382.
  10. Johnson WD, Sy FS, Jackson KL. The impact of mandatory reporting of HIV positive persons in South Carolina. In: *IV International Conference on AIDS*; June 1988; Stockholm, Sweden. Abstract 6020.
  11. Gardner L, Trow R. Anonymous testing considered essential; good follow up results. In: *VI International Conference on AIDS*; June 1990; San Francisco, Calif. Abstract Th.D.831.
  12. Kegeles SM, Coates TJ, Lo B, Catania JA. Mandatory reporting of HIV testing would deter men from being tested. *JAMA*. 1989;261:1275-1276.
  13. Kegeles SM, Catania JA, Coates TJ, et al. Many people who seek anonymous HIV-antibody testing would avoid it under other circumstances. *AIDS*. 1990;4:585-588.
  14. Phanuphak P, Sittitrai W, Barry J, Sarang-Bin B, Hanvanich W. Thailand's first anonymous alternative test site: a lesson for Asian countries. In: *VIII International Conference on AIDS/III STD World Congress*; July 1992; Amsterdam, the Netherlands. Abstract MoC 0061.
  15. Ohi G, Terao H, Hasegawa T, Hirano W, et al. Notification of HIV carriers: possible effect on uptake of AIDS testing. *Lancet*. 1988;ii:947-949.
  16. Hull HF, Bettinger CJ, Gallaher MM, et al. Comparison of HIV-antibody prevalence in patients consenting to and declining HIV-antibody testing in an STD clinic. *JAMA*. 1988;260:935-938.
  17. Kassler WJ, Meriwether R, Blankenship E, et al. Anonymous vs. confidential HIV testing in North Carolina. In: *VIII International Conference on AIDS/III STD World Congress*; July 1992; Amsterdam, the Netherlands. Abstract PoC 4818.
  18. Myers T, Orr KW, Locker D, Jackson E. Factors affecting gay and bisexual men's decisions and intentions to seek HIV testing. *Am J Public Health*. 1993;83:701-704.
  19. Browne J, Major C, Galli R, Fearon M, Chang CH. HIV anonymous testing—does it make a difference? In: *IX International Conference on AIDS/IV STD World Congress*; June 1993; Berlin, Germany. Abstract PO-C28-3249.
  20. Godin G, Myers T, Lambert J, Calzavara L, Locker D. Understanding the intention of gay men to take the HIV antibody test. In: *IX International Conference on AIDS/IV STD World Congress*; June 1993; Berlin, Germany. Abstract PO-C25-3223.
  21. Reardon J, Warren N, Keilch R, Jenssen D, Wise F, Brunner W. Are HIV-infected injection drug users taking HIV tests? *Am J Public Health*. 1993;83:1414-1417.
  22. Phillips KA. The relationship of 1988 state HIV testing policies to previous and planned voluntary use of HIV testing. *J AIDS*. 1994;7:403-409.
  23. Pavia AT, Benyo M, Niler L, Risk I. Partner notification for control of HIV: results after two years of a statewide program in Utah. *Am J Public Health*. 1993;83:1418-1424.
  24. Blankenship EM, Owen OJ, Jolly DH, Petz WJ, Meriwether RA. HIV partner notification with an anonymous testing system. In: *V International Conference on AIDS*; June 1989; Montreal, Quebec, Canada. Abstract WDP1.
  25. Rothenberg KH, Paskey SJ. The risk of domestic violence and women with HIV infection: implications for partner notification, public policy, and the law. *Am J Public Health*. 1995;85:1569-1576.
  26. Brown VB, Melchior LA, Reback CJ, Huba GJ. Mandatory partner notification of HIV test results: psychological and social issues for women. *AIDS Public Policy J*. 1994;9:86-92.
  27. Rothenberg KH, Paskey SJ, Reuland MM, Zimmerman SI, North RL. Domestic violence and partner notification: implications for treatment and counseling of women with HIV. *J Am Med Assoc*. 1995;273:87-93.

## Alcohol and Drug Use, Abuse, and Dependence among Welfare Recipients

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### ABSTRACT

**Objectives.** This paper presents national estimates of heavy drinking, drug use, and alcohol and drug abuse and/or dependence among recipients of selected welfare programs.

**Methods.** Data from the 1992 National Longitudinal Alcohol Epidemiologic Survey were analyzed.

**Results.** The percentages of welfare recipients using, abusing, or dependent on alcohol or drugs were relatively small and consistent with the general US population and those not receiving welfare benefits.

**Conclusions.** Although a minority of welfare recipients have alcohol or drug problems, substance abuse prevention and treatment services are needed among high-risk subgroups. (*Am J Public Health*. 1996;86:1450-1454)

### Introduction

The network of federal programs designed to help the nation's needy has rapidly grown since the Great Depression, most notably as the result of the War on Poverty. Recent concerns regarding these programs, referred to collectively as welfare, have generated great debate in the current administration and among lawmakers. At the center of this often intense and emotional political debate are characterizations of welfare recipients that are usually not supported by empirical data. One such characterization depicts the welfare mother in particular as having an alcohol or drug problem. It was the objective of the present study to provide the most recent national estimates of the prevalence of heavy alcohol use, drug use, and alcohol and drug abuse

and dependence among welfare recipients participating in five social services programs: Aid to Families with Dependent Children (AFDC); the Special Supplemental Food Program for Women, Infants, and Children (WIC); food stamps; supplemental security income (SSI); and Medicaid. The major goal of the study was to identify high-risk subgroups of the welfare population in need of prevention,

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**TABLE 1—Prevalence of Past Year Heavy Drinking and DSM-IV Alcohol Abuse and/or Dependence among Recipients of Aid to Families with Dependent Children (AFDC), Supplemental Food Program for Women, Infants, and Children (WIC), and Food Stamps, by Sex, Race, and Age**

	AFDC <sup>a</sup>			WIC <sup>b</sup>			Food Stamps <sup>c</sup>		
	Population Estimate (Thousands)	Heavy Drinking, % (SE)	Alcohol Abuse/Dependence, % (SE)	Population Estimate (Thousands)	Heavy Drinking, % (SE)	Alcohol Abuse/Dependence, % (SE)	Population Estimate (Thousands)	Heavy Drinking, % (SE)	Alcohol Abuse/Dependence, % (SE)
Sex									
Male	559.7	20.9 (4.4)	9.6 (2.9)	974.3	26.0 (3.8)	18.6 (3.3)	2 818.9	24.9 (2.1)	13.9 (1.7)
Female	3 523.0	12.0 (1.2)	7.3 (1.0)	3 250.3	7.1 (0.9)	4.7 (0.8)	7 256.6	9.5 (0.7)	5.9 (0.6)
Race									
Black	1 495.8	10.2 (1.4)	7.2 (1.3)	1 077.9	7.9 (2.1)	7.4 (2.1)	3 210.1	13.0 (1.3)	8.6 (1.1)
Non-Black	2 586.9	15.0 (1.8)	7.8 (1.3)	3 146.6	12.7 (1.3)	8.1 (1.1)	6 865.4	14.2 (1.0)	8.0 (0.8)
Age, y									
18–24	1 113.6	11.5 (2.4)	7.2 (1.6)	1 778.8	10.7 (1.7)	6.6 (1.4)	2 035.9	13.2 (1.6)	8.1 (1.2)
25–34	1 655.0	17.6 (1.9)	10.7 (1.9)	1 850.3	12.9 (1.8)	9.1 (1.8)	3 227.4	17.8 (1.5)	11.1 (1.4)
35+	1 314.1	9.2 (1.7)	3.9 (1.0)	595.4	9.4 (2.4)	6.2 (2.4)	4 812.2	11.4 (1.2)	6.2 (0.8)
Total	4 082.8	13.2 (1.3)	7.6 (0.9)	4 224.5	11.5 (1.1)	7.9 (1.0)	10 075.5	13.8 (0.8)	8.2 (0.6)

Note. As a result of rounding, components may not add to totals.

<sup>a</sup>Cash assistance to needy children who lack the financial support of one parent because that parent is continuously absent from the home, incapacitated, dead, or unemployed.

<sup>b</sup>Nutrition program to improve the nourishment of pregnant and postpartum women, infants, and children under 6 years of age.

<sup>c</sup>Used to purchase food; intended to permit members of low-income households to obtain a more nutritious diet.

intervention, and treatment of alcohol and drug problems.

## Methods

The data presented in this report were collected in the 1992 National Longitudinal Alcohol Epidemiologic Survey (NLAES) designed by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), with fieldwork conducted by the Bureau of the Census. Direct face-to-face interviews were conducted with one randomly selected respondent, 18 years of age or older, in each of 42 862 households within the contiguous United States and the District of Columbia. The household response rate for the NLAES was 91.9%, and the individual response rate was 97.4%. The sampling design of the survey involved stratification and clustering, along with oversampling of Blacks and young adults (18 to 29 years of age); the design has been described more fully elsewhere.<sup>1,2</sup> Because of the complex multistage nature of the survey, SUDAAN,<sup>3</sup> a software program that uses appropriate statistical techniques to adjust for sample design characteristics, was used to generate the prevalence estimates and statistical tests presented in this report. Statistical comparisons among sociodemographic subgroups of the welfare population were accomplished by means of *t* tests (*P* > .01

denoting significance due to multiple comparisons).

NLAES respondents were asked whether they received AFDC, WIC, SSI or Medicaid payments, or food stamps during the month prior to the interview. The survey estimates of the number of adults covered by these programs were very similar to those derived from the 1992 Current Population Survey<sup>4</sup> and 1992 program statistics derived from the federal agencies that administer such programs: the Department of Health and Human Services (HHS) for AFDC (L. Carrera, written communication, Administration for Children and Families, Office of Family Assistance), Medicaid,<sup>5</sup> and SSI (J. Schmulowitz, written communication, Office of Research Statistics, Social Security Administration), and the Department of Agriculture for WIC<sup>6</sup> and food stamps.<sup>7</sup> It should be noted that the NLAES estimates of program participation presented in this report do not include recipients under the age of 18 years or recipients residing in institutions, nor do they reflect multiple recipients of welfare programs residing in the same household. Furthermore, recipients may also have been receiving support from more than one welfare program during the previous year.

In this report, heavy drinking was operationalized as an average daily ethanol consumption exceeding 1 oz (28 g)

(i.e., more than two drinks per day) or consumption of five or more drinks on at least 12 occasions (i.e., once a month or more) during the previous year. Any drug use was defined as taking of any of the following medicines or drugs "on your own" (i.e., without a prescription) at least 12 times during the previous year: sedatives, tranquilizers, opioids other than heroin, amphetamines, cannabis (including hashish), methadone, heroin, or other drugs such as hallucinogens, inhalants, or solvents. Diagnoses of alcohol or drug abuse and/or dependence were obtained from lists of symptom items operationalizing definitions appearing in the *Diagnostic and Statistical Manual of Mental Disorders* (4th edition; DSM-IV).<sup>8</sup> Respondents classified as abusers were required to meet at least one of the following criteria: continued use despite social or interpersonal problems, hazardous use, legal problems, and neglect of role obligations. A diagnosis of dependence required affirmative responses to three or more of the following seven criteria: tolerance; withdrawal; unsuccessful attempts or persistent desire to stop use; use for longer or in larger amounts than intended; activities given up in favor of use; time spent in obtaining, using, or recovering from substance effects; and continued use despite physical or psychological problems. The complex algorithms designed to yield these DSM-IV diagnoses have been de-

**TABLE 2—Prevalence of Past Year Heavy Drinking and DSM-IV Alcohol Abuse and/or Dependence among Recipients of Supplemental Security Income (SSI) and Medicaid, by Sex, Race, and Age**

	SSI <sup>a</sup>			Medicaid <sup>b</sup>		
	Population Estimate (Thousands)	Heavy Drinking, % (SE)	Alcohol Abuse/Dependence, % (SE)	Population Estimate (Thousands)	Heavy Drinking, % (SE)	Alcohol Abuse/Dependence, % (SE)
<b>Sex</b>						
Male	1 545.5	11.3 (2.2)	7.8 (1.9)	3 620.8	15.8 (1.5)	7.5 (1.1)
Female	2 670.7	3.6 (0.7)	2.2 (0.5)	8 447.9	7.9 (0.7)	4.3 (0.4)
<b>Race</b>						
Black	1 140.9	7.9 (1.6)	4.8 (1.2)	3 145.1	11.0 (1.1)	5.9 (0.8)
Non-Black	3 074.5	5.9 (1.1)	4.1 (0.9)	8 923.6	9.9 (0.8)	4.9 (0.6)
<b>Age, y</b>						
18–29	593.4	6.8 (3.1)	5.4 (2.9)	3 720.9	12.9 (1.2)	8.4 (0.9)
30–54	1 332.2	9.4 (1.8)	8.1 (1.7)	3 667.0	13.8 (1.3)	7.7 (1.0)
55+	2 290.6	4.6 (1.0)	1.8 (0.6)	506.8	5.3 (0.7)	0.8 (0.2)
Total	4 216.3	6.4 (0.9)	4.3 (0.8)	12 068.7	10.3 (0.6)	5.2 (0.5)

<sup>a</sup>Provides cash benefits, paid monthly, to elderly, blind, and disabled persons who are financially needy.

<sup>b</sup>Furnishes medical assistance on behalf of needy families with dependent children and on behalf of elderly, blind, or permanently and totally disabled individuals whose incomes and resources are insufficient to meet the costs of necessary medical services.

**TABLE 3—Prevalence of Past Year Drug Use and DSM-IV Drug Abuse and/or Dependence among Recipients of Aid to Families with Dependent Children (AFDC), Supplemental Food Program for Women, Infants, and Children (WIC), and Food Stamps, by Sex, Race, and Age**

	AFDC			WIC			Food Stamps		
	Population Estimate (Thousands)	Any Drug Use, % (SE)	Drug Abuse/Dependence, % (SE)	Population Estimate (Thousands)	Any Drug Use, % (SE)	Drug Abuse/Dependence, % (SE)	Population Estimate (Thousands)	Any Drug Use, % (SE)	Drug Abuse/Dependence, % (SE)
<b>Sex</b>									
Male	559.8	10.3 (3.1)	5.6 (2.3)	974.3	11.0 (3.0)	18.6 (3.3)	2 818.9	11.6 (1.5)	3.6 (0.8)
Female	3 523.0	9.7 (0.9)	3.3 (0.5)	3 250.3	6.0 (0.8)	4.7 (0.8)	7 256.6	7.2 (0.6)	2.4 (0.4)
<b>Race</b>									
Black	1 495.8	7.4 (1.0)	2.86 (0.7)	1 077.9	4.5 (1.2)	1.2 (0.5)	3 210.1	7.5 (1.0)	1.9 (0.4)
Non-Black	2 586.9	11.1 (1.2)	4.09 (0.7)	3 146.6	8.1 (1.1)	2.9 (0.7)	6 865.4	8.8 (0.7)	3.1 (0.4)
<b>Age, y</b>									
18–24	1 113.6	14.6 (2.2)	3.9 (1.2)	1 778.8	8.7 (1.5)	3.5 (1.1)	2 035.9	13.9 (1.7)	3.6 (0.9)
25–34	1 655.1	10.7 (1.5)	4.3 (0.9)	1 850.3	5.9 (1.2)	1.7 (0.6)	3 227.4	11.3 (1.2)	3.8 (0.7)
35+	1 314.0	4.7 (1.0)	2.5 (0.8)	595.4	6.7 (2.3)	2.0 (1.1)	4 812.2	4.1 (0.6)	1.6 (0.4)
Total	4 082.8	9.8 (0.9)	3.6 (0.5)	4 224.5	7.2 (0.9)	2.5 (0.6)	10 075.5	8.4 (0.6)	2.7 (0.3)

Note. As a result of rounding, components may not add to totals. See Table 1 for program descriptions.

financed in detail elsewhere.<sup>9</sup> The reliabilities of alcohol use, abuse, and dependence measures used in this study exceeded .73 (kappa coefficients), as ascertained from an independent test–retest study conducted in a general population sample.<sup>10</sup> Similarly, kappa coefficients associated with drug use, abuse, and dependence measures exceeded .79.

## Results

The prevalence of heavy drinking was similar among recipients of AFDC

(13.2%), WIC (11.5%), and food stamps (13.8%) (Table 1) and somewhat lower among recipients of SSI (6.4%) and Medicaid (10.3%) (Table 2). Prevalences of DSM-IV alcohol abuse and/or dependence among recipients of AFDC (7.6%), WIC (7.9%), and food stamps (8.2%) (Table 3) were also greater than comparable prevalences among SSI (4.3%) and Medicaid (5.2%) recipients (Table 4). Similarly, rates of any drug use ranged from 7.2% to 9.8% for AFDC, WIC, and food stamp recipients but were lower among recipients of SSI (3.8%) and

Medicaid (6.0%). Overall, the rates of drug abuse and/or dependence were also greater for recipients of AFDC, WIC, and food stamps (2.5% to 3.6%) than for SSI (1.3%) and Medicaid (2.0%) recipients.

Prevalences of heavy drinking and of alcohol abuse and/or dependence were significantly greater for men than for women ( $P < .01$ ) in each welfare program except AFDC. There were no sex differences found for drug use or drug use disorder measures across welfare programs. Rates of heavy drinking, drug use, and alcohol and drug abuse and/or

**TABLE 4—Prevalence of Past Year Drug Use and DSM-IV Drug Abuse and/or Dependence among Recipients of Supplemental Security Income (SSI) and Medicaid, by Sex, Race, and Age**

	SSI			Medicaid		
	Population Estimate (Thousands)	Any Drug Use, % (SE)	Drug Abuse/Dependence, % (SE)	Population Estimate (Thousands)	Any Drug Use, % (SE)	Drug Abuse/Dependence, % (SE)
<b>Sex</b>						
Male	1 545.5	4.3 (1.2)	1.3 (0.4)	3 620.7	5.9 (0.9)	2.4 (0.6)
Female	2 678.7	3.5 (0.9)	1.3 (0.4)	8 447.9	6.0 (0.5)	1.9 (0.3)
<b>Race</b>						
Black	1 140.9	5.4 (1.9)	1.5 (0.8)	3 145.1	6.1 (0.9)	1.9 (0.4)
Non-Black	3 075.4	3.2 (0.7)	1.2 (0.3)	8 923.6	6.0 (0.6)	2.1 (0.3)
<b>Age, y</b>						
18–29	593.1	4.0 (1.6)	1.1 (0.7)	3 720.9	11.5 (1.0)	3.4 (0.6)
30–54	1 332.3	8.8 (1.8)	3.6 (0.8)	3 667.1	7.4 (0.9)	3.3 (0.6)
55+	2 290.6	0.8 (0.4)	0.0 (0.0)	4 680.7	0.5 (0.2)	0.0 (0.0)
Total	4 216.3	3.8 (0.7)	1.3 (0.3)	12 068.7	6.0 (0.5)	2.0 (0.3)

Note. As a result of rounding, components may not add to totals. See Table 2 for program descriptions.

dependence were also not significantly different between non-Black and Black recipients of AFDC, WIC, food stamps, SSI, and Medicaid.

Among AFDC and food stamp recipients, but not WIC recipients, heavy drinking, drug use, and alcohol and drug abuse and/or dependence were more prevalent ( $P < .01$ ) in the 25- to 34-year age group than in the oldest (35 years and older) age group. For SSI and Medicaid recipients, the rates of heavy drinking, drug use, and alcohol and drug abuse and/or dependence were greatest among 30- to 54-year-olds. For Medicaid recipients, rates of all four alcohol and drug problem measures were also greater ( $P < .01$ ) among 18- to 29-year-olds than among those in the oldest age group.

## Discussion

Contrary to common characterizations of the welfare population as having alcohol and drug problems, the results of this study indicate that small percentages of AFDC, WIC, food stamp, SSI, and Medicaid recipients are heavy drinkers (6.4% to 13.8%), use drugs (3.8% to 9.8%), or abuse or are dependent on alcohol (4.3% to 8.2%) or other drugs (1.3% to 3.6%). These rates among welfare recipients were similar to national estimates derived from the NLAES survey for heavy drinking (14.5%), any drug use (5.0%), alcohol abuse and/or dependence (7.4%), and drug abuse and/or dependence (1.5%).<sup>9</sup> Also, they are comparable to rates of heavy drinking

(14.8%), drug use (5.1%), alcohol abuse and/or dependence (7.5%), and drug abuse and/or dependence (1.5%) among the subpopulation of the United States not receiving welfare benefits.

In general, the sociodemographic differentials associated with heavy drinking and alcohol abuse and/or dependence observed in the US general population were not entirely preserved within the subgroup of welfare recipients. In the general population, rates for all four alcohol and drug problem indicators are greater among men than among women. Among welfare recipients, indicators of alcohol problems were greater for men than for women, except AFDC recipients, but no sex differences were found in the rates of drug problem indicators. Although the prevalences of heavy drinking, drug use, and alcohol and drug abuse and/or dependence are generally greater among non-Blacks than among Blacks in the general population, no ethnic differences were found in these measures among welfare recipients. There was, however, a trend for the rates of each problem indicator to be greater among non-Blacks than among Blacks, except among SSI and Medicaid recipients. In addition, in comparison with those in the older age group, heavy drinking, drug use, and alcohol and drug abuse and/or dependence were significantly greater among 25- to 34-year-old recipients of AFDC and food stamps, but not WIC, and among 30- to 54-year-old SSI and Medicaid recipients.

Although the reasons for the observed sex, ethnic, and age differentials in terms of alcohol and drug problem indicators among welfare recipients remain unclear, more substantive future analyses carried out within a multivariate environment may clarify the questions raised in this study. However, this study has achieved its purpose of identifying high-risk subgroups of the welfare population in need of alcohol and drug prevention, intervention, and treatment programs. Education programs, screening efforts, and provisions for treatment of alcohol and drug problems could be incorporated into the welfare system of social services, just as provisions currently exist for training and employment services for AFDC recipients and nutrition education for WIC recipients. The implementation of prevention programs and treatment services for alcohol and drug problems among welfare recipients would foster and facilitate the major goals of work, responsibility, and reduction of dependency that form the basis of the proposed welfare reform. □

## References

1. Grant BF, Peterson A, Dawson DA, Chou P. *Source and Accuracy Statement for the National Longitudinal Alcohol Epidemiologic Survey*. Rockville, Md: National Institute on Alcohol Abuse and Alcoholism; 1994.
2. Massey JT, Moore TF, Parsons VL, Tadros W. Design and estimation of the National Health Interview Survey, 1985–1994. *Vital Health Stat [32]*. 1989; DHHS publication PHS 89-1384.

3. *Software for Survey Data Analysis, Version 5.5*. Research Triangle Park, NC: Research Triangle Institute; 1994.
4. *Poverty in the United States*. Washington, DC: US Bureau of the Census; 1993. Current Population Reports series P 60-185.
5. Bureau of Data Management and Strategy. *Medicaid Vendor Payments of Medical Care by Race/Ethnicity and by Region and State: Fiscal Year 1992*. Baltimore, Md: Health Care Financing Administration; 1994.
6. Program Information Division. *Special Supplemental Food Program (WIC) for Women, Infants, and Children: Racial/Ethnic Participation, 1992*. Washington, DC: US Dept of Agriculture; 1992.
7. *U.S. Department of Agriculture Data Base: Food Stamp Participation, 1992*. Washington, DC: US Dept of Agriculture; 1992.
8. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. Washington, DC: American Psychiatric Association; 1994.
9. Grant BF, Harford TC, Dawson DA, Chou P, Dufour M, Pickering R. Prevalence of DSM-IV alcohol abuse and dependence: United States, 1992. *Alcohol Health Res World*. 1994;18:243-248.
10. Grant BF, Harford TC, Dawson DA, Chou SP, Pickering RP. The Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS): reliability of alcohol and drug modules in a general population sample. *Drug Alcohol Dependence*. 1995;39:37-44.

## ABSTRACT

**Objectives.** This study examined the connection between the use of anticonvulsants for epilepsy during or before pregnancy and the risk of spina bifida and cleft lip in newborns.

**Methods.** Among mothers registered from 1967 to 1992 by the Medical Birth Registry of Norway, 7588 who had epilepsy were identified and their newborns' prevalence of spina bifida and cleft lip examined.

**Results.** The odds ratio of spina bifida in children of mothers with epilepsy compared with other children increased from 1.5 in 1967 through 1980 (95% confidence interval [CI] = 0.3, 4.5) to 4.4 in 1981 through 1992 (95% CI = 2.0, 8.5). The odds ratio of cleft lip, however, decreased from 3.0 before 1981 (95% CI = 1.6, 5.1) to 1.1 after 1981 (95% CI = 0.4, 2.3).

**Conclusions.** This shift toward more serious birth defects is consistent with the different teratogenic effects of newer and older anticonvulsants. (*Am J Public Health*. 1996;86:1454-1456)

# Spina Bifida and Cleft Lip among Newborns of Norwegian Women with Epilepsy: Changes Related to the Use of Anticonvulsants

Pernille Bolton King, MD, Rolv T. Lie, PhD, and Lorentz M. Irgens, MD, PhD

## Introduction

Anticonvulsants have, for a long time, been suspected teratogens, with respect to both minor and major malformations.<sup>1-6</sup> For valproic acid, an association with spina bifida was already suspected in 1982.<sup>2</sup> Since then, several studies have supported a causal relationship.<sup>5</sup> The risk of spina bifida among valproic acid-exposed infants has been estimated to be about 2%, compared with 0.05% among unexposed infants. An increased risk of spina bifida is also suspected after use of carbamazepine, but the risk is estimated to be less than 1%.<sup>5</sup> Orofacial clefts have been associated with the use of phenytoin and phenobarbital.<sup>6</sup> We hypothesized that secular changes in the use of anticonvulsants could be reflected in the occurrence of spina bifida and orofacial clefts among children of mothers with epilepsy.

## Methods

The Medical Birth Registry of Norway was established in 1967 and is a population-based compulsory notification system covering all births in Norway. The registry holds information about mothers' health before and during the pregnancy, about the delivery, and about the child. Spina bifida and orofacial clefts are reported with a certainty of more than 80%<sup>7</sup> and are probably the most precisely ascertained types of defects in the regis-

try. Furthermore, it is not likely that ascertainment is much affected either by time or by epilepsy status. Secular trends in the occurrence of these defects may therefore be studied without serious ascertainment bias.

From 1967 through 1992, 1 506 851 newborns were identified. All together, 7558 children had mothers with a recorded history of epilepsy either before or during the pregnancy. Mothers without epilepsy were used as a control group. Since valproic acid was in regular use after 1980, the data were divided into one period from 1967 through 1980 and a second period from 1981 through 1992. This categorization was decided upon before the data were analyzed.

With the use of odds ratios, the prevalences of spina bifida and orofacial clefts in newborns with mothers who had epilepsy were compared with those observed in newborns of mothers without epilepsy. Risks of birth defects are small, and thus, odds ratios can provide a good approximation of relative risks. Secular changes in odds ratios of birth defects were studied by exact logistic models

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